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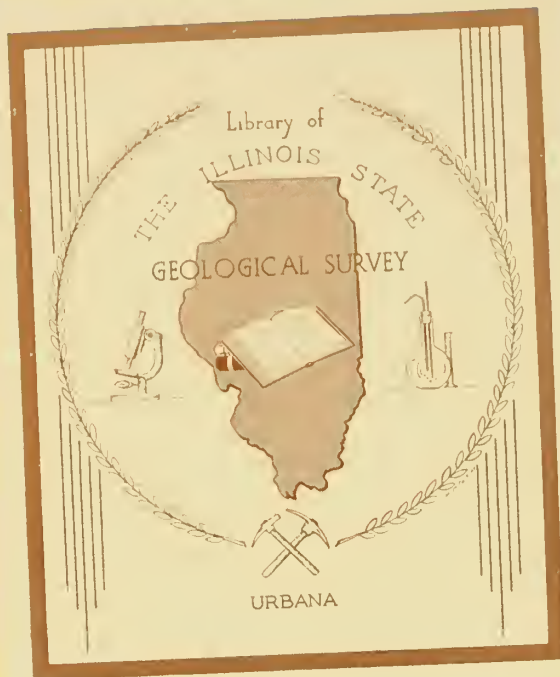
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DATA FROM CONTROLLED DRILLING PROGRAM IN LAKE COUNTY AND THE NORTHERN PART OF COOK COUNTY, ILLINOIS

compiled by
CHARLES R. LUND

ILLINOIS STATE GEOLOGICAL SURVEY

JOHN C. FRYE, Chief • Urbana



DATA FROM CONTROLLED DRILLING PROGRAM IN
LAKE COUNTY AND THE NORTHERN PART OF COOK COUNTY, ILLINOIS

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Descriptions of character and sequence of materials and data on relative consistency, natural water content, and grain-size distribution are given for glacial deposits tested and sampled, as a part of a controlled drilling program, at four sites in Lake County and three in the northern part of Cook County, Illinois.

INTRODUCTION

Data gathered from field and laboratory analyses of samples collected from four holes drilled in Lake County and three holes drilled in the northern part of Cook County (fig. 1) are presented here. These holes were drilled as part of a study of water resources management in the six-county metropolitan area of northeastern Illinois conducted by the Northeastern Illinois Metropolitan Area Planning Commission and financed by a planning grant provided by the Federal Home and Housing Finance Agency. Fifty-two holes were drilled in the area to obtain data and samples of the subsurface unconsolidated materials, which are mainly glacial drift deposits. The work was supervised by the Illinois State Geological Survey, and drilling was performed under contract by the Layne-Western Company of Aurora, Illinois.

The first number of this series (Environmental Geology Notes 1, April 1965) gave the specific objectives of the drilling and sampling program, a description of the drilling methods and equipment used to obtain the samples, and an explanation of the methods used to perform the various tests made on the samples by both the contractor and the Illinois Geological Survey. Environmental Geology Notes 2, 6, and 7 presented the data collected in DuPage County, Kane, Kendall, and DeKalb Counties, and McHenry County, respectively. Data from borings in Will County and the southern part of Cook County will appear in a future issue of this series.

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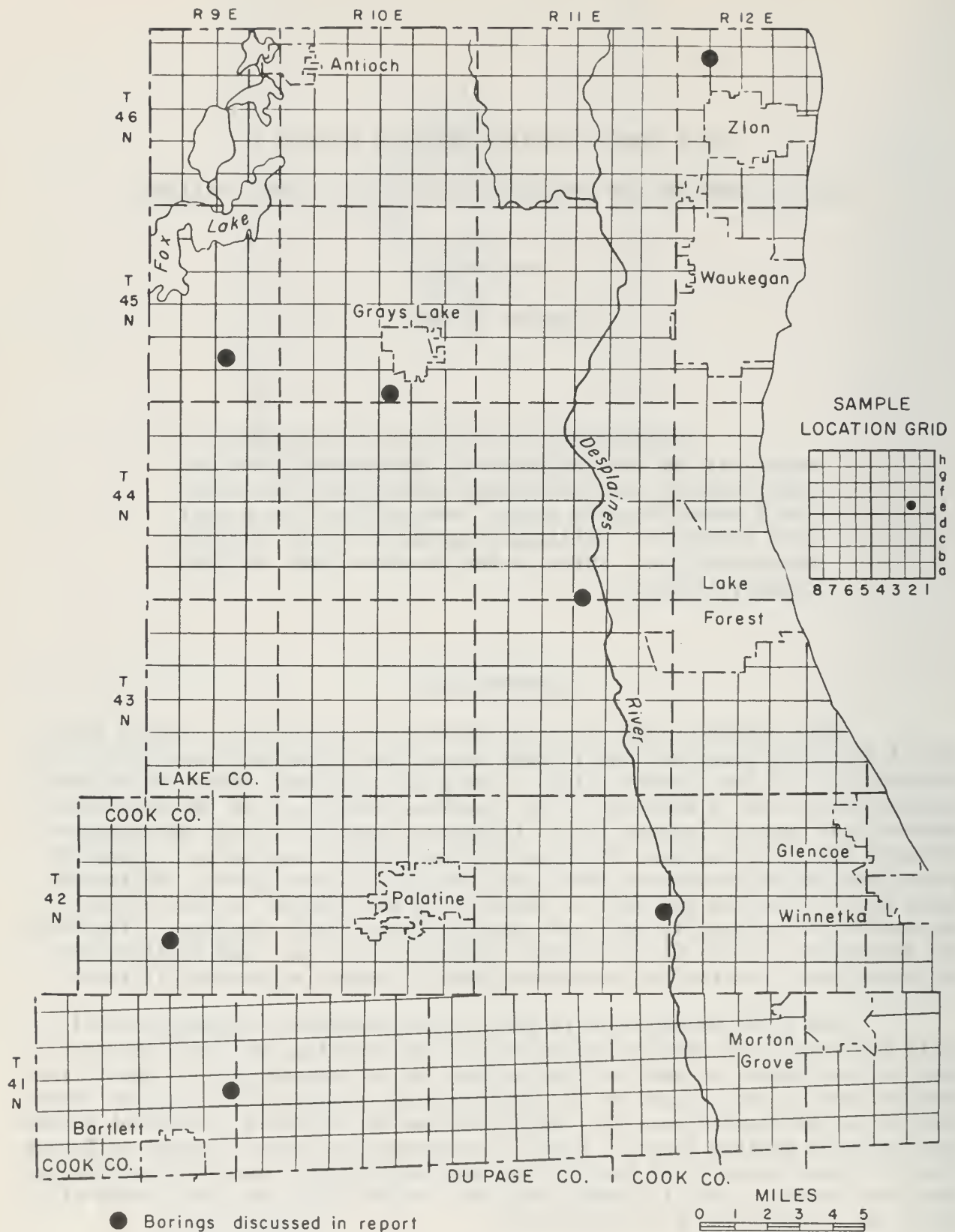


Fig. 1 - Location of borings in Lake County and the northern part of Cook County, Illinois

IDENTIFICATION SYSTEM

The numbering system used to identify the borings is based on the location of the boring. The number of each hole consists of the county abbreviation, township, range, section, and coordinates within the section. Sections are divided into rows of one-eighth-mile squares. Each square contains 10 acres and corresponds to a quarter of a quarter section. A section of one square mile generally contains eight rows of eighth-mile squares; an odd-sized section contains more or fewer rows. Rows are numbered from east to west and lettered from south to north as shown on the grid in figure 1. For example, a well located in square 2e of section 24, township 41 north, range 9 east, Cook County, would be numbered COK 41N9E-24.2e. Where there is more than one boring in a 10-acre square they are identified by arabic numbers after the lower case letter in the boring number, for example, COK 41N9E-24.2e2.

A location map is presented for each of the seven borings, drawn on the scale of one inch equals 2000 feet, or 1:24,000, the scale of the United States Geological Survey 7½-minute quadrangle topographic maps. The borings have been located within the 10-acre coordinate squares, with as much accuracy as this scale permits, according to detailed footage locations from easily recognizable landmarks supplied by the contractor.

The 7½-minute quadrangle topographic map on which the boring is located is identified on the location map. Quadrangle maps may be obtained from the Illinois State Geological Survey, Urbana, or from the United States Geological Survey, Washington, D. C.

EXPLANATION OF NOTES ON DRILLING RECORDS

The abbreviations and symbols used by the contractor on the drilling records included in this report are listed below.

Blows/18" - number of blows required to drive the split-barrel sampler 18 inches of penetration (see Environmental Geology Notes 1, p. 2, for detailed description). Weight of hammer and length of drop for the various depth intervals are indicated on the log heading.

81/2" - number of blows (81) required to drive a split-barrel sampler a certain number of inches (2").

Recovery (in.) - length of the sample retained in the sampler.

Q_u - unconfined compressive strength expressed in tons per square foot (TSF).

MC - natural moisture content.

SS - split-barrel sampler 1 3/8 inches inside diameter (ID).

2S - split-barrel sampler 2 inches ID.

3S - split-barrel sampler 3 inches ID.

A - retractable-type auger.

W - wash sample.

ctgs. - cuttings from wash sample.

X - used where duplication of sample number occurred.

The relations between descriptive terms for relative density and relative consistency and the quantitative expressions for these aspects of the materials follow.

Relative Density
(Pertains only to standard
140-lb. hammer)

Description	Blows/ft
Very loose.....	0 - 5
Loose.....	5 - 10
Medium dense.....	10 - 30
Dense.....	30 - 50
Very dense.....	50+

Relative Consistency

Description	Qu in TSF
-------------	-----------

Very soft.....	0.0 - 0.25
Soft.....	0.25 - 0.5
Medium.....	0.5 - 1.0
Stiff.....	1.0 - 2.0
Very stiff.....	2.0 - 4.0
Hard.....	4.0+

Descriptions of materials given in the drilling records were made in the field by the contractor at the time of drilling and are not necessarily consistent with the laboratory data obtained at a later date. Stratigraphic interpretation of the borings is under study and is beyond the scope of this report.

SIZE-DISTRIBUTION ANALYSIS

Analysis of the density and grain-size distribution of the cohesive and noncohesive materials was carried out in the laboratories of the Illinois State Geological Survey, Urbana. The Tyler sieves and their U.S. Standard equivalents used in the grain-size analyses, the diameter of the mesh openings in inches and millimeters, and the Wentworth grain-size classification are shown on page 5.

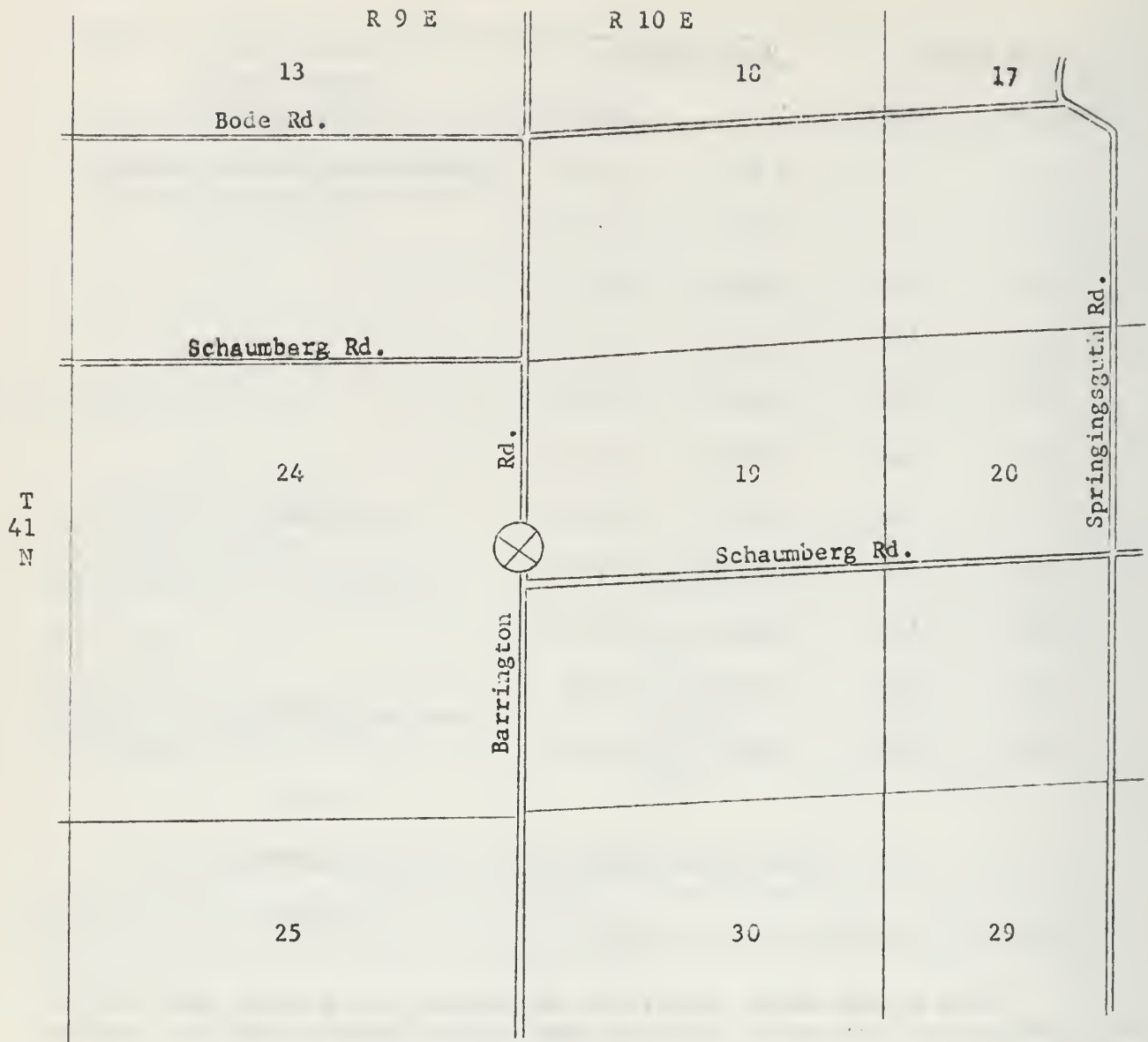
The data presented in the size-distribution analysis for each boring are classified as follows:

gravel - > 2.0 mm
sand - < 2.0 mm and > 0.062 mm
silt - < 0.062 mm and > 0.004 mm
clay - < 0.004 mm

Sieve number		Mesh diameter		Grain-size classification (Wentworth)
U. S. Standard	Tyler	in.	mm	
4	4	0.185	4.699	Granules and pebbles (gravel) -----2.0 mm-----
10	9	0.078	1.981	
18	16	0.0390	0.991	
25	24	0.0276	0.701	
35	32	0.0195	0.495	
45	42	0.0138	0.351	Sand
60	60	0.0097	0.246	
80	80	0.0069	0.175	
120	115	0.0049	0.124	
170	170	0.0035	0.088	
230	250	0.0024	0.061	-----0.0625 mm-----
				Silt
Hydrometer separation				-----0.0039 mm-----
				Clay

Some of the sample numbers in the tables giving grain-size data on the cohesive and noncohesive materials have letter symbols added that indicate the following:

- A - top bag of sample where two bags were used for a sampled interval.
- B - bottom bag of sample where two bags were used for a sampled interval.
- U - upper portion of sample where one bag was used for a sampled interval.
- Bo - lower portion of sample where one bag was used for a sampled interval.



Location Detail

26' W of Barrington Road
400' N of Schaumburg Road
26' W, 2200' S of NE_C of sec. 24
Streamwood Quadrangle

Fig. 2 - Location of boring COK 41N9E-24.1e

DRILLING RECORD FOR COK 41N9E-24.1e

Surface elevation: 819.0 feet	Boring method: Rotary (0.0-176.5 ft)
Date started: 11-23-62	Hammer weight: 475 pounds
Date completed: 11-27-62	Hammer drop: 36 inches

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
2.5	Topsoil, black							
4.5	Clay, silty, light brown; few pebbles	1	2S	5.0- 6.5	12	10	3.6	16.0
9.5	Till - clay, brown, pebbly	2	2S	10.0- 11.5	0	13		
	Till - clay, silty, gray; few pebbles; trace sand	3	2S	15.0- 16.5	18	16	1.9	22.3
		4	2S	20.0- 21.5	18	18	1.5	22.0
		5	2S	25.0- 26.5	11	12	1.5	22.6
30.0		6	2S	30.0- 31.5	14	15	1.3	16.0
		7	2S	35.0- 36.5	12	11	0.8	21.7
		8	2S	40.0- 41.5	12	15	1.6	13.9
	Till - clay, silty, gray; pebbles; seam of gray-brown clayey silt and thin fine sand seam @ 45'	9	2S	45.0- 46.5	18	10		18.1
		10	2S	50.0- 51.5	18	16	1.6	12.7
		11	2S	55.0- 56.5	18	22	1.6	16.7
		12	2S	60.0- 61.5	8	16		
65.0	Till - clay, silty, gray, pebbly	13	2S	65.0- 66.5	5	32	1.2	15.6

(Continued)

DRILLING RECORD FOR COK 41N9E-24.1e - Continued

Depth (1"=10')	Description of material	Samples							
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC	
78.0	Till - clay, silty, gray, pebbly	14	2S	70.0- 71.5	12	30	1.2	17.2	
		15	2S	75.0- 76.5	14	17	1.5	20.4	
87.0	Gravel, sandy, gray	16	2S	80.0- 81.5	11	96			
		17	2S	85.0- 86.5	8	46			
107.0	Till - clay, silty, gray; clayey silt at base; trace sand	18	2S	90.0- 91.5	5	not valid	1.0	17.2	
		19	2S	95.0- 96.5	12	49	0.6	14.3	
		20	2S	100.0-101.5	0	18			
		21	2S	105.0-106.5	6	23		19.2	
142.0	Sand, gray, fine to coarse, well sorted	22	2S	110.0-111.5	5	24			
		23	2S	115.0-116.5	12	32			
		24	2S	120.0-121.5	14	37			
		25	2S	125.0-126.5	8	42			
		26	2S	130.0-131.5	6	60			
		27	2S	135.0-136.5	6	not valid			
		28	2S	140.0-141.5	12	136			
	Sand and gravel, coarse and fragmental @ 153'; no sorting								

(Continued)

DRILLING RECORD FOR COK 41N9E-24.1e - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u MC
153.5	Sand and gravel, coarse and fragmental @ 153'; no sorting	29	2S	147.0-148.5	14	not valid	
		30	2S	153.0-154.5	4	not valid	
		31	2S	157.0-158.5	8	not valid	
	Sand, fine, gray, well sorted; gray silt beds 2" to 4" thick	32	2S	160.0-161.5	14	not valid	
		33	2S	165.0-166.5	12	not valid	
175.0		34	2S	170.0-171.5	14	46	
175.5	Bedrock - dolomite, gray; fossiliferous; broken	35	2S	175.0-176.5	12	44	
	Bottom of hole @ 175.5'						

SIZE DISTRIBUTION DATA FOR COK 41N9E-24.1e

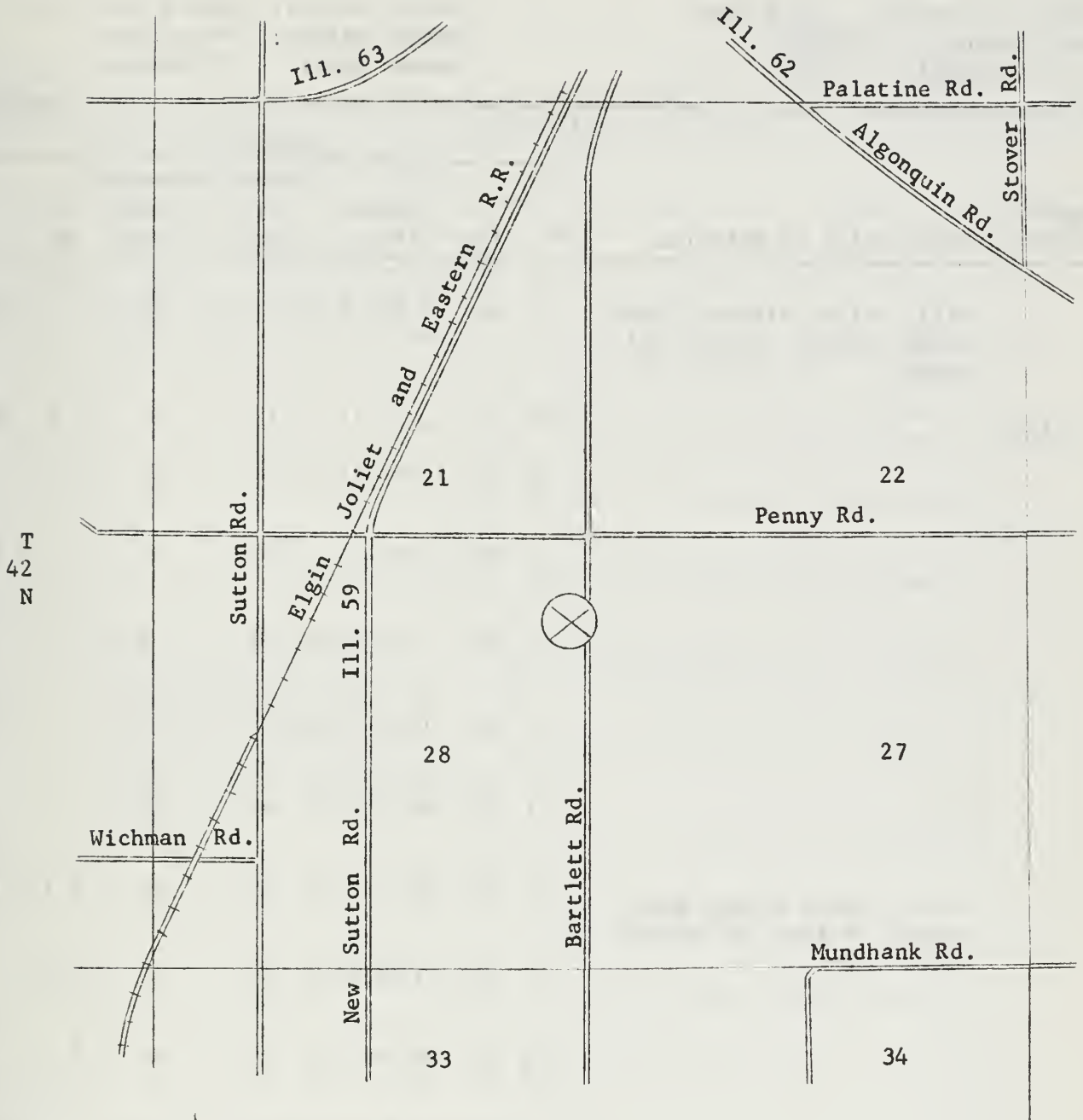
Cohesive Materials

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
1	6.0	94.0	15	43	42
3A	13.0	87.0	17	35	48
4	4.0	96.0	6	34	60
5	3.0	97.0	9	43	48
6	23.0	77.0	23	10	67
7	1.0	99.0	6	77	17
8	2.0	98.0	5	36	59
9	3.0	97.0	6	75	19
10	12.0	88.0	26	49	25
11	8.0	92.0	14	38	48
12	17.0	83.0	27	53	20
13	29.0	71.0	8	42	50
14	3.0	97.0	7	45	48
18	6.0	94.0	9	45	46
21	3.0	97.0	16	44	40

Noncohesive Materials

Sample	Percentage retained on sieve										
	4	9	16	24	32	42	60	80	115	170	Pan
16	65.5	14.4	12.9	3.1	0.5	0.8	0.5	0.3	0.3	0.2	1.5
17	49.2	17.5	14.0	4.4	4.7	3.4	2.4	1.2	1.1	0.8	1.3
22	16.5	2.4	1.7	0.9	5.8	20.1	26.9	11.0	5.5	2.2	6.9
23	0.4	0.6	1.3	0.8	1.8	5.5	18.7	25.2	24.9	10.0	10.8
25	2.5	2.4	2.4	2.2	26.3	44.6	9.8	2.4	1.5	0.9	5.0
27	71.3	13.7	5.7	1.4	1.2	1.0	0.7	0.6	0.7	0.6	3.1
28	43.5	13.0	9.3	3.5	4.5	3.9	3.8	2.3	2.3	1.7	12.2
30	69.2	9.9	6.1	2.0	1.8	1.7	1.3	0.9	1.1	0.9	5.1
31	62.9	15.2	11.8	1.8	1.5	1.0	0.8	0.5	0.6	0.5	3.4
33	0.0	0.1	1.6	0.9	1.0	0.9	2.1	9.0	25.2	20.9	38.3
34A	4.2	0.3	0.2	0.1	0.3	0.8	4.4	16.3	30.4	19.2	23.8

R 9 E



Location Detail

998' S of Penny Road
17' W of Bartlett Road
17' W, 998' S of NE_c of sec. 28
Streamwood Quadrangle

Fig. 3 - Location of boring COK 42N9E-28.1g

DRILLING RECORD FOR COK 42N9E-28.1g

Surface elevation: 862.0 feet

Date started: 11-28-62

Date completed: 12-7-62

Boring method: Rotary (0.0-229.0 ft)

Hammer weight: 475 pounds

Hammer drop: 36 inches

Depth (1"=10')	Description of material	Samples							
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC	
11.0	Till - silt, clayey, light brown; traces of sand and gravel	1	2S	5.0-	6.5	8	44	9.3	17.5
		2	2S	10.0-	11.5	18	18	9.3	20.0
	Till - clay, silty, gray; traces of sand and gravel; sand lenses	3	2S	15.0-	16.5	14	10	3.8	15.5
		4	2S	20.0-	21.5	4	12		20.4
		5	2S	25.0-	26.5	6	8		19.0
		6	2S	30.0-	31.5	12	18		21.1
		7	3S	35.0-	36.5	16	28		
		8	3S	40.0-	41.5	18	20	9.7	17.6
		9	2S	45.0-	46.5	18	25	6.0	
		10	2S	50.0-	51.5	18	28	5.6	16.0
		11	2S	55.0-	56.5	18	40		20.6
		12	2S	60.0-	61.5	0	60		
		13	W	65.0-	66.5	ctgs.			
		14	W	70.0-	71.5	ctgs.			

(Continued)

DRILLING RECORD FOR COK 42N9E-28.1g - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u MC
77.0	Till - clay, silty, gray; traces of sand and gravel; sand lenses	15	W	75.0- 77.0		ctgs.	
81.0	Gravel, sandy, silty, coarse; cobbles and boulders	16	3S	80.0- 81.5	18	170	
84.0	Sand, gray, well sorted; thin layers of gray-brown silt	17	3S	85.0- 86.5	7	82	
		18	2S	90.0- 91.5	8	100	
		19	2S	95.0- 96.5	6	not valid	
		20	W	100.0-101.5		ctgs. refusal	
	Gravel, sandy, silty, coarse, gray; traces of cobbles and boulders; a few beds of sorted sands; boulder beds @ 131.0'; lower part of section very coarse	21	2S	105.0-106.5	12	103	
		22	3S	110.0-111.5	6	212	
		23	3S	115.0-116.5	10	not valid	
		24	2S	120.0-121.5	12	103	
		25	W	125.0-126.5		ctgs. refusal	
		26	W	130.0-131.5		ctgs. refusal	
133.0		27	2S	134.0-135.5	8	62	13.6
	Till - clay, silty, red- brown; traces of sand and gravel; approximately 12" gray till on top of unit; streaks of gravel	28	W	140.0-141.5		ctgs. 113*	
		29	2S	145.0-146.5	18	213	7.4 13.5
		30	2S	150.0-151.5	16	231	9.7+ 12.7

* Blow count from driving of 2S sampler — no sample recovery with spoon.

(Continued)

DRILLING RECORD FOR COK 42N9E-28.1g - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Qu	MC
		31	2S	155.0-156.5	16	103	9.7+	11.9
	Till - clay, silty, red-brown; traces of sand and gravel; approximately 12" gray till on top of unit; streaks of gravel	32	2S	160.0-161.5	18	85	5.8	10.5
		33	2S	165.0-166.5	18	62	5.6	11.4
		34	2S	170.0-171.5	18	42	4.7	11.6
174.0								
	Clay, black; traces of sand and silt	35	2S	175.0-176.5	18	92	9.7+	19.1
180.0								
	Silt, clayey, green; little to trace of sand, gravel, shale fragments; yellow, mottled	36	2S	180.0-181.5	18	94	9.7+	16.1
184.0								
	Silt, light brown	37	2S	185.0-186.5	18	45		22.5
		37X	2S	190.0-191.5	14	42		
		38	2S	195.0-196.5	10	52		
197.0								
	Till - silt, clayey, red-brown; traces of sand and gravel	39	2S	200.0-201.5	18	82	9.7+	16.1
		40	2S	205.0-206.5	10	87		18.1
208.0								
	Silt, stratified, red to brown; some organic inclusions; changing to fine sand @ 215'	41	2S	210.0-211.5	18	45		19.9
		42	2S	215.0-216.5	14	120		
218.0								
	Gravel, gray; silt; sand; cobbles	43	2S	220.0-221.5	4	122		
225.0								

(Continued)

DRILLING RECORD FOR COK 42N9E-28.1g - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u MC
229.0	Till - silt, sandy, gray-brown; trace clay and coarse sand, grains subangular to round; some cobbles	44	2S	225.0-226.0	0	refusal	
		45	2S	226.0-226.7	4	172-refusal	
	Bottom of hole @ 229.0'						

SIZE DISTRIBUTION DATA FOR COK 42N9E-28.1g

Cohesive Materials

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
1	3.0	97.0	13	40	47
2	3.0	97.0	11	38	51
3	13.0	87.0	20	43	37
4	16.0	84.0	18	39	43
5	4.0	96.0	13	40	47
6	4.0	96.0	9	37	54
7	3.0	97.0	4	31	65
8	1.0	99.0	4	33	63
9	0.1	99.9	4	45	51
10	2.0	98.0	11	45	44
11	8.0	92.0	8	45	47
12	8.0	92.0	13	47	40
13	5.0	95.0	13	44	43
14	25.0	75.0	16	42	42
19	7.0	93.0	18	54	28
27	3.0	97.0	33	37	30
29	3.0	97.0	25	39	36
30	3.0	97.0	24	40	36
31	3.0	97.0	26	40	34
32	6.0	94.0	29	34	37

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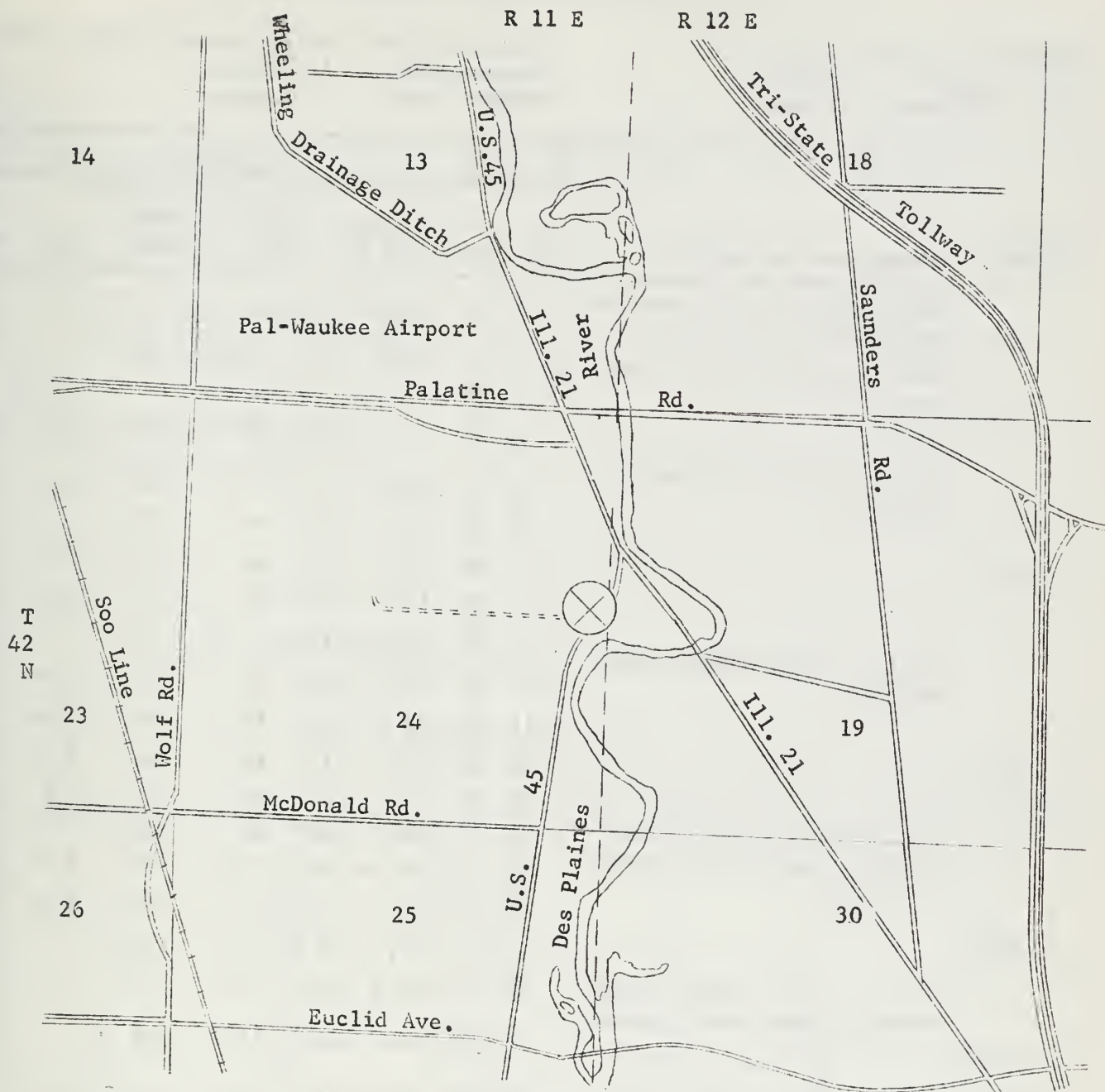
SIZE DISTRIBUTION DATA FOR COK 42N9E-28.1g - Continued

Cohesive Materials - Continued

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
33	3.0	97.0	25	43	32
34	4.0	96.0	29	44	27
35	0.2	99.8	9	41	50
36	0.7	99.3	27	29	44
37	2.0	98.0	67	24	9
37X	0.0	100.0	2	66	32
38	0.1	99.9	3	77	20
39	4.0	96.0	19	33	48
40	4.0	96.0	19	33	48
41B	0.0	100.0	1	65	34
42Bo	0.3	99.7	89	10	1
43	41.0	59.0	65	22	13
45	22.0	78.0	36	43	21

Noncohesive Materials

Sample	Percentage retained on sieve										Pan
	4	9	16	24	32	42	60	80	115	170	
16B	37.8	13.6	11.8	4.2	3.9	3.5	3.9	2.6	2.2	1.7	14.8
18	48.1	14.7	8.1	2.3	2.8	3.1	4.3	3.1	2.6	1.8	9.1
22	10.6	9.8	36.5	10.1	5.3	3.0	3.2	4.2	5.1	2.8	9.4
23	60.7	12.3	8.6	2.6	2.6	1.9	1.6	1.2	1.3	1.0	6.2
26	45.0	19.7	26.6	2.6	1.3	0.9	0.8	0.5	0.5	0.3	1.8
42U	0.0	0.3	0.4	0.6	1.4	5.5	20.4	22.1	17.4	10.2	21.7



Location Detail

42' N of F. & H. Schuler driveway
 150' W of U.S. 45
 250' W, 2550' S of NE_C of sec. 24
 Arlington Heights Quadrangle

Fig. 4 - Location of boring COK 42N11E-24.1e

DRILLING RECORD FOR COK 42N11E-24.1e

Surface elevation: 640.0 feet
Date started: 11-20-62
Date completed: 11-24-62

Boring method: Hollow auger (0.0-88.5 ft)
Hammer weight: 140 pounds
Hammer drop: 30 inches

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
4.0	Clay, silty, brown mottled with gray; silt seams	1	2S	2.0- 3.5	15	16	3.1	22.7
9.0	Silt, clayey, gray; trace sand	2	2S	4.5- 6.0	8	29		23.4
		3	2S	7.0- 8.5	0	17		
19.0	Till - clay, silty gray; pebbles	4	2S	9.5- 11.0	10	13	2.0	13.9
		5	2S	12.0- 13.5	15	12	1.2	14.4
		6	2S	14.5- 16.0	0	15		
		7	2S	17.0- 18.5	16	22	3.7	13.8
31.5	Till - silt, clayey, gray; pebbles	8	2S	19.5- 21.0	18	26	5.2+	16.0
		9	2S	22.0- 23.5	8	96		13.1
		10	2S	24.5- 26.0	12	42	5.2+	13.5
		11	2S	27.0- 28.5	16	61	5.2+	14.8
		12	2S	29.5- 31.0	18	56	5.2+	14.7
42.5	Till - clay, silty, gray; pebbles; silty sand seams @ 33-35.5'	13	2S	32.0- 33.5	14	74	2.2	18.7
		14	2S	34.5- 36.0	12	86		
		15	2S	37.0- 38.5	10	68	5.2+	10.3
		16	2S	39.5- 41.0	12	54	5.2+	11.2
49.0	Till - silt, clayey, gray; pebbly; trace sand; grades to silt @ 47'	17	2S	42.0- 43.5	10	210		
		18	2S	44.5- 46.0	18	87		
		19	2S	47.0- 48.5	13	116		
51.5	Till - clay, silty, gray; sandy, pebbly, and cobbly	20	2S	49.5- 51.0	12	72	5.2+	10.0
61.5	Till - sand, silty, gray, fine; cobbly; rock fragments	21	2S	52.0- 53.5	10	278		
		22	2S	54.5- 56.0	12	252		
		23	2S	57.0- 58.5	14	286		
		24	2S	59.5- 61.0	11	300/11"		
65.5	Gravel, sandy, gray	25	2S	62.0- 62.5	2	100/2"		
		26	2S	64.5- 65.0	2	109/6"		
	Till - silt, sandy, gray; little clay; bouldery; large amount of lime fragments; very dense; sand pockets	27	SS	67.0- 68.5	12	114	4.0	8.4
		28	SS	69.5- 71.0	14	157	4.5+	7.2

(Continued)

DRILLING RECORD FOR COK 42N11E-24.1e - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
78.0	Till - silt, sandy, gray; little clay; bouldery; large amount of lime fragments; very dense; sand pockets	29	SS	72.0- 73.5	6	125/14"		
		30	SS	74.5- 76.0	8	74		
		31	SS	77.0- 78.5	10	130/14"		
86.0	Limestone, light gray, fine grained; sand with rock fragments; boulders	32	SS	79.5- 80.5	10	130/10"		
		33	SS	84.5- 85.5	9	130/9"		
88.5	Rock, broken; gravel	34	SS	88.5-Refusal	0	Refusal		
	Bottom of hole @ 88.5'							

SIZE DISTRIBUTION DATA FOR COK 42N11E-24.1e

Cohesive Materials

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
1	0.0	100.0	1	37	62
2	1.0	99.0	9	38	53
4	17.0	83.0	21	44	35
5	8.0	92.0	23	46	31
7	12.0	88.0	22	48	30
8	5.0	95.0	18	43	39
9	5.0	95.0	10	78	12
10	3.0	97.0	10	59	31
11A	1.0	99.0	9	56	35
12	4.0	96.0	13	49	38
13	2.0	98.0	19	53	28
14Bo	2.0	98.0	25	50	25
15	7.0	93.0	20	46	34
16	5.0	95.0	19	45	36
17	0.0	100.0	2	86	12
18	7.0	93.0	16	52	32
19	1.0	99.0	14	78	8
20	14.0	86.0	26	43	31
21	27.0	73.0	63	27	10
22	11.0	89.0	63	29	8

(Continued)

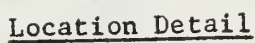
SIZE DISTRIBUTION DATA FOR COK 42N11E-24.1e - Continued

Cohesive Materials - Continued

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
23A	20.0	80.0	61	31	8
24	27.0	73.0	57	33	10
27	20.0	80.0	35	46	19
28	15.0	85.0	36	46	18
29	26.0	74.0	34	46	20
30	14.0	86.0	28	49	23
31	43.0	57.0	40	44	16

Noncohesive Materials

Sample	Percentage retained on sieve										
	4	9	16	24	32	42	60	80	115	170	Pan
14A	0.2	0.4	0.4	0.2	0.3	1.4	9.5	17.9	23.9	14.7	31.1
25	50.8	10.7	6.9	1.6	1.7	1.5	2.2	3.6	5.6	4.0	11.4
32	0.0	1.5	2.2	1.4	1.4	0.9	2.7	8.5	21.4	18.3	41.7



406' E of E edge of bridge over DesPlaines River
16' N of center line of Ill. 59A
150' N, 1950' E of SW_C of sec. 34
Wheeling Quadrangle

Fig. 5 - Location of boring LKE 44N11E-34.6a

DRILLING RECORD FOR LKE 44N11E-34.6a

Surface elevation: 655.0 feet
Date started: 11-13-62
Date completed: 11-15-62

Boring method: Hollow auger (0.0-81.0 ft)
Hammer weight: 140 pounds
Hammer drop: 30 inches

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recovery (in.)	Blows/18" drop hammer	Q _u	MC
6.0	Road fill	1	A	0.0- 6.0				
11.5	Clay, gray, mottled with brown; fiber traces	2	2S	7.0- 8.5	6	10	1.3	33.9
		3	2S	9.5- 11.0	12	11	0.6	34.9
15.5	Sand, gray, fine; organic seams and layers	4	2S	12.0- 13.5	12	8		
27.5	Gravel, sandy, gray, fine	5	2S	14.5- 16.0	18	11		24.1
		6	2S	17.0- 18.5	4	12		
		7	2S	19.5- 21.0	0	22		
		8	2S	24.5- 26.0	0			
31.5	Clay, gray	9	SS	29.5- 31.0	10	36	3.0	16.8
37.0	Till - silt, clayey, gray; silt layers; few pebbles	10	SS	32.0- 33.5	12	50	5.2+	13.5
		11	2S	34.5- 36.0	12	70	4.5+	12.2
41.5	Sand, gray, fine; silt layers; stratified	12	SS	37.0- 38.5	8	75		13.4
		13	SS	39.5- 41.0	14	80		
44.5	Gravel, sandy, light gray, fine to coarse; trace silt	14	SS	42.0- 43.5	12	48		
46.5	Silt, light gray; trace fine sand	15	SS	44.5- 46.0	12	72		
49.5	*	16	SS	47.0- 48.5	14	102		
51.5	Till - clay, silty, gray; pebbles	17	SS	49.5- 51.0	14	68	3.7	14.4
54.0	Sand, gravelly, light gray	18	SS	52.0- 53.5	8	125/8"		
71.5	Till - clay, silty, gray; pebbles	19	SS	54.5- 56.0	2	65		
		20	SS	57.0- 58.5	18	75	5.2-	11.0
		21	SS	59.5- 61.0	12	61	5.2-	11.2
		22	SS	62.0- 63.5	18	40	3.9	13.2
		23	SS	64.5- 66.0	18	61	3.0	12.4
		24	SS	67.0- 68.5	8	130		17.4
		25	SS	69.5- 71.0	6	110		

* Sand, silty, light gray layers of compact sandy silt; pebbles and rock fragments mixed in

(Continued)

DRILLING RECORD FOR LKE 44N11E-34.6a - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u MC
76.5	Clay, gray; seams and part- ings of silt; stratified	26	SS	72.0- 73.5	6	40	20.5
		27	2S	74.5- 76.0	18	34	25.0
81.0	Sand, silty to silt, sandy, gray; gravel; few cobbles and rock fragments	28	2S	77.0- 78.0	10	125/10"	9.2
		29	SS	79.0- 80.0	9	100/9"	
		30	SS	81.0-refusal		100/0"	
	Bottom of hole @ 81.0'						

SIZE DISTRIBUTION DATA FOR LKE 44N11E-34.6a

Cohesive Materials

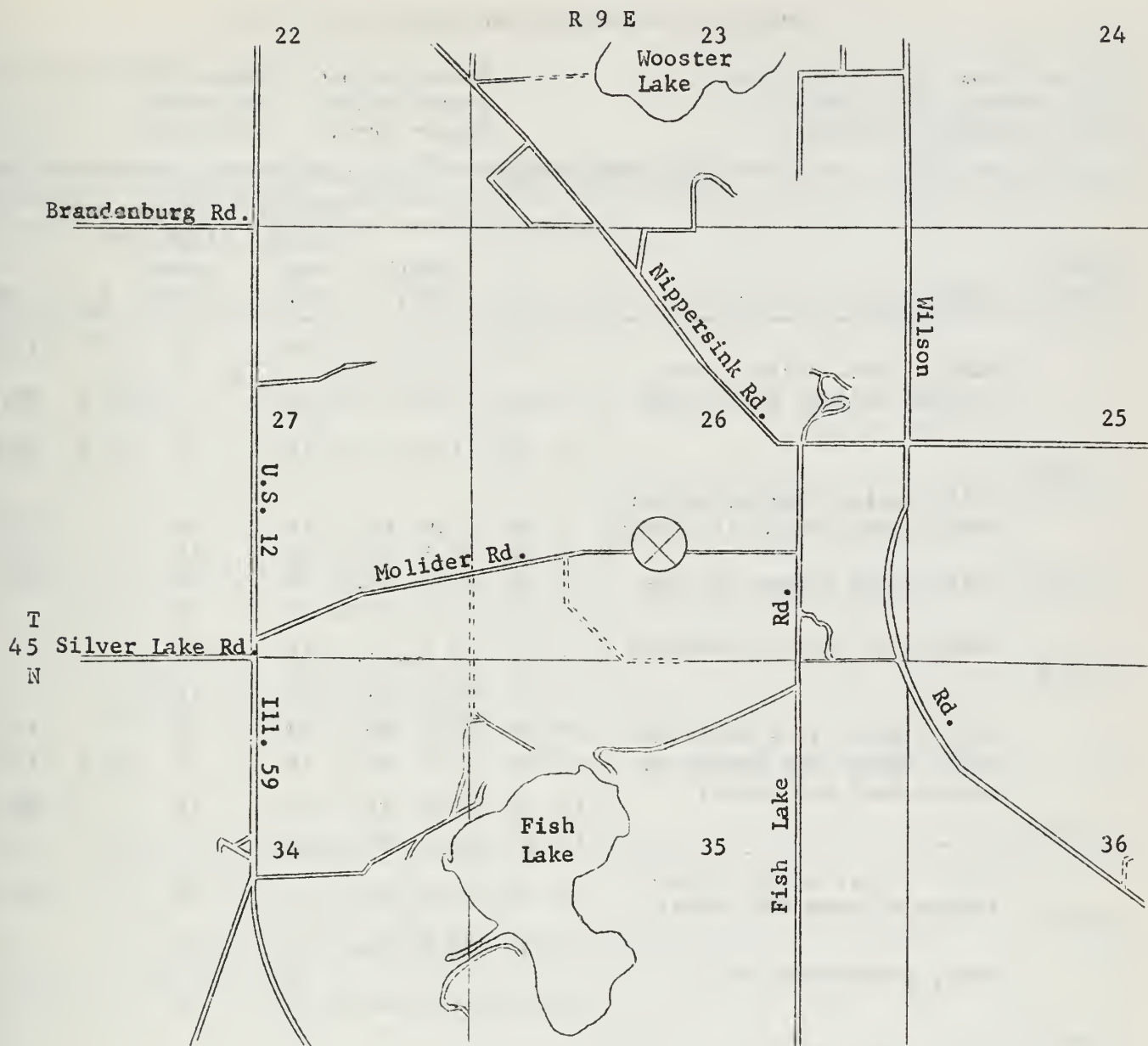
Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
2	0.0	100.0	8	46	46
3	0.0	100.0	7	48	45
4	0.0	100.0	58	28	14
5	0.0	100.0	58	29	13
9	1.0	99.0	6	36	58
10	0.0	100.0	2	67	31
11	2.0	98.0	8	68	24
12	5.0	95.0	25	56	19
13	0.0	100.0	41	52	7
15	0.0	100.0	3	89	8
16	3.0	97.0	37	58	5
17	4.0	96.0	12	40	48
19	52.0	48.0	48	44	8
20	5.0	95.0	16	46	38
21	4.0	96.0	16	43	41
22A	6.0	94.0	18	45	37
23A	3.0	97.0	16	45	39
24	8.0	92.0	16	46	38
25	9.0	91.0	20	43	37
26	10.0	90.0	15	42	43
27	8.0	92.0	14	41	45
28	24.0	76.0	36	47	17

(Continued)

SIZE DISTRIBUTION DATA FOR LKE 44N11E-34.6a - Continued

Noncohesive Materials

Sample	Percentage retained on sieve										Pan
	4	9	16	24	32	42	60	80	115	170	
6	24.9	32.3	10.4	2.6	3.5	3.8	5.8	4.2	3.2	1.9	7.4
7	7.5	53.9	25.1	4.0	3.9	2.6	1.3	0.6	0.4	0.3	0.4
8	61.9	23.8	9.9	1.4	0.9	0.5	0.3	0.3	0.3	0.2	0.5
14	43.4	15.6	10.1	3.4	4.3	4.3	3.8	2.3	2.1	1.8	8.9
18	42.7	12.1	5.7	1.7	1.9	2.3	3.3	3.3	4.2	4.1	18.7



Location Detail

45' N of Molider Road
10' E of 8th power pole W of Fish Road
2250' E, 1500' N of SW_C of sec. 26
Wauconda Quadrangle

Fig. 6 - Location of boring LKE 45N9E-26.5c

DRILLING RECORD FOR LKE 45N9E-26.5c

Surface elevation: 775.0 feet

Date started: 12-21-62

Date completed: 2-23-63

Boring method: Rotary (0.0-179.0 ft)

Hammer weight: 475 pounds

Hammer drop: 36 inches

Depth (1"=10')	Description of material	Samples							
		No.	Type	Depth (ft)	Recovery (in.)	Blows/18" drop hammer	Q _u	MC	
9.5	Till - clay, silty, gray, mottled yellow; trace sand.	1	2S	2.5- 4.0	16	6	1.3	15.9	
		2	2S	5.0- 6.5	18	4	1.4	36.1	
		3	2S	7.5- 9.0	18	5	1.5	23.6	
11.5	Till - silt, clayey, brown; sand traces; thin silt layers	4	2S	10.0- 11.5	18	10		18.8	
		5	2S	12.5- 14.0	18	11		18.0	
17.0	Silt, gray; traces of clay	6	2S	15.0- 16.5	18	12		17.5	
		7	2S	17.5- 19.0	12	17			
22.0	Sand, fine, gray, saturated	8	2S	20.0- 21.5	18	18			
		9	2S	22.5- 24.0	13	11			
32.0	Till - gray, fine sand and silt; traces and lenses of coarse sand and gravel	10	2S	25.0- 26.5	18	13		14.6	
		11	2S	27.5- 29.0	18	14	0.9	13.2	
		12	2S	30.0- 31.5	10	12		16.6	
		13	2S	32.5- 34.0	13	27	3.1	12.6	
37.0	Till - clay, silty, brown; traces of sand and gravel	14	2S	35.0- 36.5	4	30		13.3	
		15	2S	37.5- 39.0	16	30			
44.5	Sand, gray-brown, fine	16	2S	42.5- 44.0	10	51			
		17	2S	47.5- 50.0	14	37			
47.5	Peat, brown, fibrous	18	2S	52.5- 54.0	14	29			
62.0	Sand, fine, gray-brown; thin coarse seams; thin clay beds in lower part; stratified	19	2S	57.5- 59.0	16	27			
		20	2S	62.5- 64.0	10	62			
		21	2S	67.5- 69.0	4	53			
	Gravel, sandy, gray; trace silt								

(Continued)

DRILLING RECORD FOR LKE 45N9E-26.5c - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
94.5	Gravel, sandy, gray; trace silt	22	2S	72.5- 74.0	0	61		
		23	2S	77.5- 78.1	4	55/4"		
		24	2S	82.5- 84.0	10	46		
		25	2S	87.5- 89.0	0	77		
119.0	Till - silt, sandy; some gravel, cobbles, and boulders	26	2S	97.0-102.0	0			
		27	W	105.0-106.5		184		
		28	2S	110.0-111.0	4	100/7"		
		29	2S	115.0-116.5	7	150/7"	5.2+	8.5
124.0	Clay, pinkish gray; few silt partings and seams	30	2S	120.0-121.5	12	36	5.2+	21.4
129.5	Till - sand, silty, gray; trace clay and gravel; more clayey at base	31	2S	125.0-126.5	12	100/17"		10.8
143.0	Clay, pinkish gray; silt partings and layers	32	2S	130.0-131.5	18	100	5.2+	17.3
		33	2S	135.0-136.5	14	50	5.2+	20.8
		34	2S	140.0-141.5	16	50	5.2+	22.8
147.5	Till - clay, silty, pinkish gray; little sand and gravel; sand seams	35	2S	145.0-146.5	16	100	5.2+	10.7
156.0	Clay, pinkish gray	36	2S	150.0-151.5	12	100/12"	5.2+	13.5

(Continued)

DRILLING RECORD FOR LKE 45N9E-26.5c - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
163.0	Till - clay, silty, pinkish gray; little sand and gravel; occasional boulder near base	36X	2S	155.0-156.5	12	100/14"	5.2+	13.7
		37	2S	160.0-161.5	4	100/8"		
175.0	Till - silt, clayey, brown; little to some sand and gravel; occasional cobble or boulder	38	2S	165.0-166.5	4	121/12"		
		39	2S	170.0-171.5	0	105/8"		
179.0	Bedrock - limestone, dolomitic	40	W	175.0-179.0				
	Bottom of hole @ 179.0'							

SIZE DISTRIBUTION DATA FOR LKE 45N9E-26.5c

Cohesive Materials						
Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm			
			% >.062 mm	% >.004 mm	% <.004 mm	
2A	0.0	100.0	3	36	61	
3B	1.0	99.0	3	52	45	
4A	0.0	100.0	0	60	40	
5A	0.0	100.0	5	87	8	
6B	0.0	100.0	2	78	20	
7	0.0	100.0	49	48	3	
8B	0.0	100.0	43	53	4	
9	8.0	92.0	46	50	4	
10	3.0	97.0	13	58	29	
11A	2.0	98.0	15	58	27	
12	2.0	98.0	12	63	25	
13	2.0	98.0	12	57	31	
14	4.0	96.0	12	68	20	

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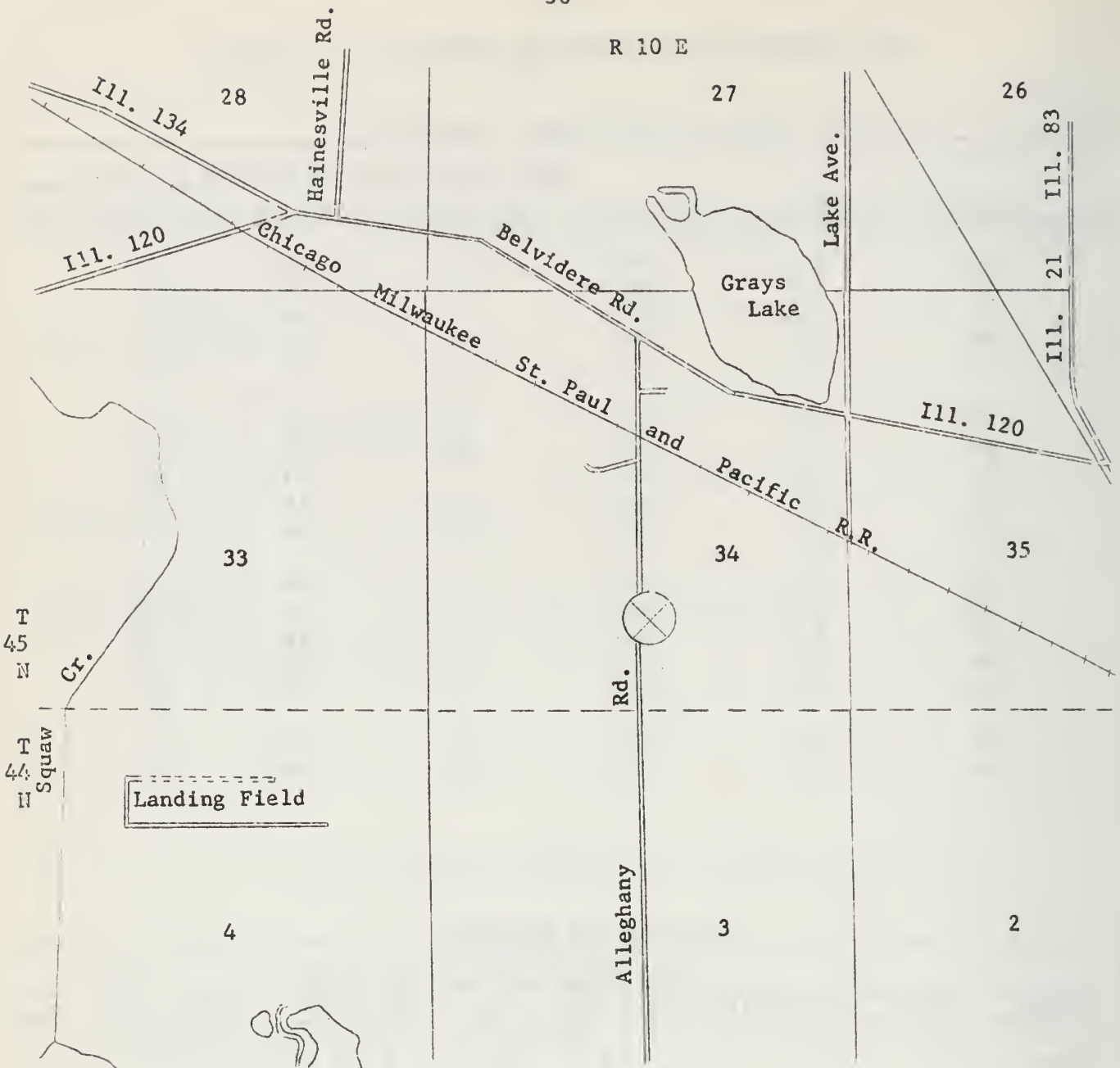
SIZE DISTRIBUTION DATA FOR LKE 45N9E-26.5c - Continued

Cohesive Materials - Continued

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
16A	1.0	99.0	69	28	3
17	0.0	100.0	4	94	2
18	0.0	100.0	2	94	4
19	0.0	100.0	0	83	17
27	13.0	87.0	57	30	13
28	11.0	89.0	59	32	9
29	5.0	95.0	48	42	10
30	0.0	100.0	1	33	66
31	13.0	87.0	77	19	4
32B	0.0	100.0	12	64	24
33A	0.0	100.0	1	30	69
34B	0.0	100.0	1	26	73
35B	8.0	92.0	26	42	32
36	0.0	100.0	3	49	48
36X	0.2	100.8	3	50	47
37	3.0	97.0	6	49	45
38	28.0	72.0	59	30	11

Noncohesive Materials

Sample	Percentage retained on sieve										
	4	9	16	24	32	42	60	80	115	170	Pan
8A	0.5	7.9	1.5	0.4	0.4	0.6	2.0	2.4	9.3	14.9	60.1
16B	3.0	3.9	1.8	0.4	0.5	0.6	0.9	3.5	17.4	22.9	45.1
20	37.0	5.5	6.4	4.1	7.4	10.7	13.9	6.6	2.5	1.2	4.7
21	59.1	7.9	4.8	3.1	5.1	5.2	3.9	1.7	1.5	1.3	7.2
22	0.1	0.7	8.8	5.6	7.3	7.1	7.8	8.2	14.0	12.3	28.1
23	53.6	18.8	9.2	3.1	2.9	1.9	1.3	0.9	1.1	1.1	6.1
24	20.0	18.9	14.6	5.4	7.6	8.8	9.1	5.1	3.8	1.8	4.9



Location Detail

12' E of E edge of Alleghany Road
 70' S of 7th power pole S of Chicago,
 Milwaukee, St. Paul, and Pacific Railroad tracks
 2500' W, 1200' N of SE_C of sec. 34
 Grayslake Quadrangle

Fig. 7 - Location of boring LKE 45N10E-34.4b

DRILLING RECORD FOR LKE 45N10E-34.4b

Surface elevation: 809.0 feet Boring method: Hollow auger Rotary
 Date started: 11-15-62 (0.0-81.0 ft) (81.0-246.0 ft)
 Date completed: 12-19-62 Hammer weight: 140 pounds 475 pounds
 Hammer drop: 30 inches 36 inches

Depth (1"=10')	Description of material	Samples							
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC	
7.5	Till - brown, mottled with yellow and gray clayey silt	1	2S	2.0- 3.5	18	30	2.7	13.9	
		2	2S	4.5- 6.0	18	24	4.8	15.4	
		3	2S	7.0- 8.5	18	21	4.3	16.4	
25.0	Till - clay, silty, gray; trace sand and gravel; few silt seams and pockets; sand pockets	4	2S	9.5- 11.0	12	14	2.8	16.2	
		5	2S	12.0- 13.5	18	22	4.2	16.1	
		6	2S	14.5- 16.0	18	24	4.4	17.9	
		7	2S	17.0- 18.5	18	23	3.7	17.8	
		8	2S	19.5- 21.0	18	26	4.0	18.7	
		9	2S	22.0- 23.5	18	26	2.9	16.7	
		10	2S	24.5- 26.0	18	20		9.4	
		11	2S	27.0- 28.5	18	17	3.3	10.8	
45.0	Till - clay, sandy, gray; numerous sand pockets and layers; grades to clayey sand	12	2S	29.5- 31.0	18	17	2.0	14.9	
		13	2S	32.0- 33.5	18	24	1.5	14.0	
		14	2S	34.5- 36.0	0	23			
		15	2S	37.0- 38.5	18	27	1.0	10.1	
		16	2S	39.5- 41.0	2	32			
		17	SS	42.0- 43.5	18	23	1.8	16.0	
		18	2S	44.5- 46.0	18	17	2.9	17.1	
		19	2S	47.0- 48.5	18	22	2.9		
	Till - clay, gray; pebbles	20	2S	49.5- 51.0	18	38	1.5		
		21	2S	52.0- 53.5	18	21	2.1	20.5	
		22	SS	54.5- 56.0	0	31			
		23	2S	57.0- 58.5	18	49	2.2	18.6	
		24	2S	59.5- 61.0	18	50	2.0		
		25	2S	62.0- 63.5	18	61	2.5		

(Continued)

DRILLING RECORD FOR LKE 45N10E-34.4b - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
76.5	Till - clay, gray; pebbles	26	2S	64.5- 66.0	18	85	2.0	
		27	2S	67.0- 68.5	18	119	5.2+	14.8
		28	2S	69.5- 71.0	18	60	4.3	17.4
		29	2S	72.0- 73.5	18	46	3.9	17.2
		30	2S	74.5- 76.0	18	120	4.9	16.3
	Till - silt, clayey, gray; trace sand and gravel; clay fraction increasing with depth; at about 87' clay is predominant, sand absent	31	SS	77.0- 78.5	18	90	6.8	13.9
		32	SS	79.5- 81.0	18	108		
		32X	2S	82.0- 83.5	5	22		22.8
		33	2S	84.5- 86.0	17	28	5.8	22.1
		34X	2S	87.0- 88.5	6	30		24.4
34		2S	89.5- 91.0	17	18	2.3	23.2	
35		2S	92.0- 93.5	19	28	2.1	25.0	
36		2S	94.5- 96.0	8	38	9.3	23.2	
37		2S	97.0- 98.5	8		5.5	22.3	
38		2S	99.5-101.0	12	62	3.5	23.2	
104.0		39	2S	105.0-106.5	18	33	3.1	11.0
120.0	Till - silt, clayey, gray- brown; traces of sand inter- spersed and in lenses; sand fraction decreasing downward	40	2S	110.0-111.5	0	60		
		41	2S	115.0-116.5	5	42		18.3
		42	2S	120.0-121.5	18	44		15.0
122.0	Silt, gray, stratified; thin interbeds of very fine sand							
134.0	Sand, fine to coarse, well sorted; interbedded silt (stratified)	43	2S	125.0-126.5	7	96		
		44	2S	130.0-131.5	13	98		
	139.0	Till - brown, mottled with gray silty clay; traces sand and gravel	45	2S	135.0-136.5	5	10	
	Silt, clayey, gray to brown; occasional boulder or sand beds; boulders @ 182-185'	46	2S	140.0-141.5	10		4.6	17.0
		47	2S	145.0-146.5	18	24	3.5	16.5

(Continued)

DRILLING RECORD FOR LIKE 45N10E-34.4b - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u MC
	Silt, clayey, gray to brown; occasional boulder or sand beds; boulders @ 182-185'	48	2S	150.0-151.5	12	59	9.3 17.6
		49	2S	155.0-156.5	18	62	
		50	2S	160.0-161.5	12	69	
		51	2S	165.5-167.0	4	52	
		52	2S	170.0-171.5	0	38	
		53	2S	175.0-176.5	18	44	4.5 13.3
		54	2S	180.0-181.5	18	38	9.7- 15.4
		55	2S	185.0-186.5	18	47	20.9
195.0		56	2S	190.0-191.5	18	58	7.2 17.5
	Sand, silty, fine, gray; thin beds of brown clay (1-3"); occasional cobble or boulder; stratified	57	2S	195.0-196.5	18	103	
204.0		58	2S	200.0-201.5	18	93	
	Till - silt, clayey, brick red, very hard; trace of sand and occasional cobble; clay content increasing with depth	59	2S	205.0-206.5	4	84	16.6
		60	2S	210.0-211.5	18	93	9.7- 17.5
		61	2S	215.0-216.5	18	84	9.7- 15.9
		62	2S	220.0-221.5	18	68	9.7- 20.2
228.0		63	2S	225.0-226.5	18	63	24.1

(Continued)

DRILLING RECORD FOR LKE 45N10E-34.4b - Continued

Depth (1"=10')	Description of material	Samples					
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	MC
243.5	Till - silt, clayey, gray, stiff; some to little sand and gravel	64	2S	230.0-231.5	14	102	6.9
		65	2S	235.0-236.5	12	101	9.1
		66	2S	240.0-241.5	6	120	7.9
246.0	Bedrock - dolomite, gray- white	67	W	243.5-246.0	ctgs.		
	Bottom of hole @ 246.0'						

SIZE DISTRIBUTION DATA FOR LKE 45N10E-34.4b

Cohesive Materials

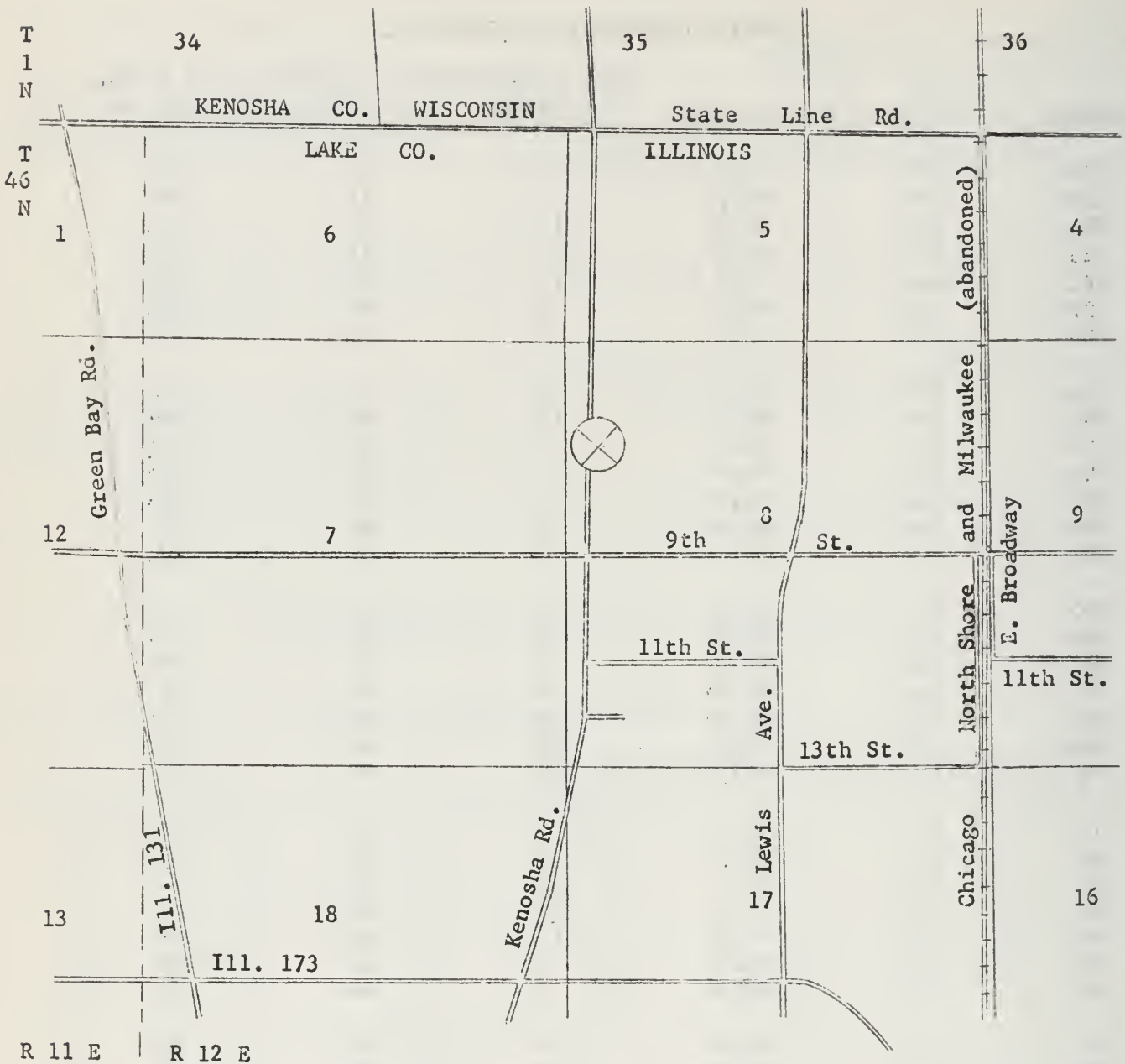
Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
1B	5.0	95.0	10	51	39
2B	8.0	92.0	18	53	29
3	6.0	94.0	9	57	34
4	1.0	99.0	8	50	42
5B	4.0	96.0	17	53	30
6A	1.0	99.0	7	52	41
6B	1.0	99.0	6	46	48
7B	1.0	99.0	5	47	48
8B	1.0	99.0	6	44	50
9	5.0	95.0	21	56	23
10	1.0	99.0	10	50	40
11B	0.0	100.0	18	58	24
12B	2.0	98.0	35	42	23
13B	6.0	94.0	35	40	25
15A	22.0	78.0	52	36	12
15B	25.0	75.0	42	39	19
16	3.0	97.0	9	52	39
17A	5.0	95.0	9	41	50
18	2.0	98.0	14	47	39
19B	7.0	93.0	8	37	55
20	4.0	96.0	10	36	54

(Continued)

SIZE DISTRIBUTION DATA FOR LKE 45N10E-34.4b - Continued

Cohesive Materials - Continued

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
21B	4.0	96.0	8	36	56
23B	2.0	98.0	9	37	54
24	8.0	92.0	11	46	43
25	5.0	95.0	18	37	45
26	3.0	97.0	11	36	53
27B	5.0	95.0	9	36	55
28B	1.0	99.0	9	36	55
29B	2.0	98.0	9	35	56
30	3.0	97.0	12	46	42
31B	2.0	98.0	9	50	41
32A	1.0	99.0	1	51	48
32B	8.0	92.0	16	54	30
33B	0.0	100.0	1	30	69
34B	0.0	100.0	0	37	63
34X	0.1	99.9	1	32	67
35B	0.0	100.0	0	27	73
36	0.0	100.0	0	32	68
37	0.0	100.0	0	28	72
38	0.0	100.0	0	28	72
39B	8.0	92.0	20	49	31
40	13.0	87.0	22	40	38
41	0.3	99.7	5	49	46
42	0.0	100.0	2	75	23
43	1.0	99.0	61	32	7
44	2.0	98.0	51	38	11
45	9.0	91.0	11	53	36
46	0.1	99.9	1	53	46
47	0.0	100.0	5	60	35
48	0.0	100.0	0	61	39
50	16.0	84.0	35	50	15
51	9.0	91.0	14	49	37
53	1.0	99.0	2	48	50
54B	0.0	100.0	1	49	50
55B	0.4	99.6	2	49	49
56	0.0	100.0	0	51	49
57B	0.0	100.0	40	54	6
59	6.0	94.0	14	40	46
60B	0.2	99.8	5	35	60
61B	0.2	99.8	4	34	62
62B	2.0	98.0	0	18	82
63B	10.0	90.0	28	40	32
64B	7.0	93.0	39	46	15
65	0.0	100.0	38	44	18
66	7.0	93.0	41	47	12



Location Detail

35' E of Kenosha Road
75' N of seventh power pole N of 9th Street
300' E, 1200' S of NW_c, sec. 8
Zion Quadrangle

Fig. 8 - Location of boring LKE 46N12E-8.8g

DRILLING RECORD FOR LKE 46N12E-8.8g

Surface elevation: 735.0 feet

Date started: 3-5-63

Date completed: 3-8-63

Boring method: Rotary (0.0-201.0 ft)

Hammer weight: 475 pounds

Hammer drop: 36 inches

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recovery (in.)	Blows/18" drop hammer	Q _u	MC
1.0	Topsoil, black							
	Till - clay, silty, brown, weathered; scattered gravel; few gravel and sand pockets	1	2S	2.5- 4.0	5	5		24.5
		2	2S	5.0- 6.5	8	14		
9.5	Till - clay, silty, gray; scattered gravel	3	2S	7.5- 9.0	16	24		15.3
		4	2S	10.0- 11.5	16	20	3.3	14.2
		5	2S	15.0- 16.5	3	12		
		6	2S	20.0- 21.5	17	14	2.1	17.6
		7	2S	25.0- 26.5	17	21	3.3	17.2
		8	2S	30.0- 31.5	10	21	2.2	15.8
		9	2S	35.0- 36.5	13	20	3.4	17.7
		10	2S	40.0- 41.5	18	24		17.5
		11	2S	45.0- 46.5	18	42	5.2+	14.5
		12	2S	50.0- 51.5	18	20	2.1	11.2
		13	2S	55.0- 56.5	18	34	4.2	20.1
		14	2S	60.0- 61.5	18	33	4.5	21.0
70.0		15	2S	65.0- 66.5	18	29	3.8	23.4

(Continued)

DRILLING RECORD FOR LKE 46N12E-8.8g - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recov- ery (in.)	Blows/18" drop hammer	Q _u	MC
73.0	Till - silt, sandy, gray; scattered gravel	16	2S	70.0- 71.5	18	24		
		17	2S	75.0- 76.5	18	33	2.3	13.6
	Till - clay, silty, gray; scattered gravel	18	2S	80.0- 81.5	18	42	3.8	15.8
		19	2S	85.0- 86.5	18	37	1.2	14.6
90.0		19X	2S	90.0- 91.5	0	60		
		20	2S	95.0- 96.5	18	37		15.3
	Till - clay, silty, gray; scattered gravel and thin layers of sand and gravel	21	2S	100.0-101.5	10	52		
105.0		22	2S	105.0-106.5	5			13.4
	Till - clay, silty, gray; scattered gravel	23	2S	110.0-111.5	18	75	5.2+	18.4
115.0		24	2S	115.0-116.5	18	63	4.3	25.8
116.0	Clay, reddish brown, fat	25	2S	120.0-121.5	10	80		
	Alluvium - sand, gray, fine to medium; layers of silt	26	2S	125.0-126.5	5	53		12.9
123.0		27	2S	130.0-131.5	18	94	5.2+	15.5
127.0	Till - silt, clayey, gray; scattered gravel	28	2S	135.0-136.5	10	100		13.8
		29	2S	140.0-141.5	16	80	5.2+	14.5
		30	2S	145.0-146.5	18	82	5.2+	11.6

(Continued)

DRILLING RECORD FOR LKE 46N12E-8.8g - Continued

Depth (1"=10')	Description of material	Samples						
		No.	Type	Depth (ft)	Recovery (in.)	Blows/18" drop hammer	Q _u	MC
162.0	Till - clay, silty, gray; scattered gravel	31	2S	150.0-151.5	18	76	5.2+	13.4
		32	2S	155.0-156.5	17	60	5.2+	13.1
		33	2S	160.0-161.5	18	61	3.3	14.8
183.0	Silt, clayey, gray	34	2S	165.0-166.5	15	61	4.2	11.7
		34X	2S	170.0-171.5	0	81		
		35	2S	175.0-176.5	15	52		14.5
		36	2S	180.0-181.5	17	41		16.0
198.0	Lacustrine - silt and clay, gray, interbedded	37	2S	185.0-186.5	18	18		19.2
		38	2S	190.0-191.5	18	40	1.7	20.0
		39	2S	195.0-196.5	18	45	1.3	17.9
201.0	Bedrock - limestone, dolomitic	40	W	198.0-201.0				
	Bottom of hole @ 201.0'							

SIZE DISTRIBUTION DATA FOR LKE 46N12E-8.8g

Cohesive Materials

Sample	% > 2.0 mm	% < 2.0 mm	Size distribution of portion < 2.0 mm		
			% > .062 mm	% > .004 mm	% < .004 mm
1	2.0	98.0	19	54	27
2	23.0	77.0	48	42	10
3E	10.0	90.0	24	43	33
4	3.0	97.0	14	54	32
5	9.0	91.0	21	52	27
6	11.0	89.0	11	47	42
7	5.0	95.0	15	50	35
8	3.0	97.0	15	43	42
9	1.0	99.0	9	40	51
10	4.0	96.0	12	46	42
11	10.0	90.0	15	48	37
12	9.0	91.0	24	45	31
13	1.0	99.0	4	34	62
14	1.0	99.0	4	31	65
15	0.0	100.0	3	36	61
16	3.0	97.0	38	57	5
17	6.0	94.0	18	56	26
18	3.0	97.0	7	47	46
19	2.0	98.0	12	64	24
20	5.0	95.0	13	67	20
21	4.0	96.0	4	40	56
22	14.0	86.0	18	51	31
23	4.0	96.0	6	31	63
26	1.0	99.0	7	63	30
27	0.1	99.9	1	44	55
28	3.0	97.0	10	46	44
29	0.1	99.9	3	43	54
30	0.1	99.9	4	45	51
33	0.0	100.0	4	68	28
34	0.0	100.0	14	65	21
35	0.0	100.0	0	76	24
36	0.0	100.0	0	71	29
37	0.0	100.0	0	43	57
38	1.0	99.0	0	32	68
39	0.0	100.0	0	53	47

(Continued)

SIZE DISTRIBUTION DATA FOR LKE 46N12E-8.8g - Continued

Noncohesive Materials

Sample	Percentage retained on sieve									
	4	9	16	24	32	42	60	80	115	170 Pan
243	0.0	0.1	0.1	0.1	0.3	11.1	55.0	14.8	6.2	2.8 9.5
25	0.5	0.5	1.2	0.7	3.5	15.2	47.1	19.0	4.8	1.7 5.8

ENVIRONMENTAL GEOLOGY NOTES SERIES

1. Controlled Drilling Program in Northeastern Illinois: J. E. Hackett and G. M. Hughes. April 1965.
2. Data from Controlled Drilling Program in DuPage County, Illinois: Jean I. Larsen and C. R. Lund. May 1965.
3. Activities in Environmental Geology in Northeastern Illinois: Jean I. Larsen and J. E. Hackett. June 1965.
4. Geological and Geophysical Investigations for a Ground-Water Supply at Macomb, Illinois: Keros Cartwright and D. A. Stephenson. July 1965.
5. Problems in Providing Minerals for an Expanding Population: H. E. Risser. July 1965.
6. Data from Controlled Drilling Program in Kane, Kendall, and DeKalb Counties, Illinois: C. R. Lund. October 1965.
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